

ABSTRACT

A method for detecting mutations and polymorphisms, including single nucleotide polymorphisms (SNP's), is based on the use of RecA-like recombinase protein and a MutS-like mismatch binding protein. RecA coated, specific DNA oligonucleotide probes (RecA filaments) are used for homology searching in duplex DNA. Location of homologous sequences results in the formation of D-loop structures containing a duplex region comprised of the oligonucleotide probe and one strand of the test DNA. Mismatches or unpaired bases in the duplex region are substrates for MutS binding. Co-localization of MutS and oligonucleotide or RecA labels is diagnostic of specific sequence differences between the probe and test DNAs. Also provided are compositions and kits useful for practicing the methods of the present invention.